Interrogating scale in the REDD+ assemblage in Papua New Guinea

Sophie Pascoe

School of Geography, University of Melbourne, 221 Bouverie St, Carlton, Victoria 3053, Australia

ARTICLE INFO

ABSTRACT

This paper traces the relations and frictions that make up the institutional assemblage for the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program in Papua New Guinea (PNG). By engaging with REDD+ using assemblage-thinking – a theoretical orientation and method that focuses on relationality, heterogeneity and emergence – this paper interrogates the dominance of scalar discourses around climate change and environmental governance. While scalar discourses predefine categories and hierarchies (such as the 'global,' 'national' and 'local'), assemblage-thinking offers a method to resist such framings and reimagine relations between power and spatiality. Through institutional ethnography and discourse analysis, this paper critically examines how scalar discourses become dominant and how they translate into environmental governance projects, specifically the Central Suau REDD+ Pilot Project. By using assemblage-thinking to problematise scalar discourses, we can see how such discourses may reinscribe inequalities by defining arenas of governance that work to exclude certain groups.

1. Introduction

Reducing Emissions from Deforestation and Forest Degradation (REDD+) is a climate change mitigation mechanism that compensates developing countries for reducing emissions from deforestation through conservation, sustainable forest management and carbon stock enhancement. Since Papua New Guinea (PNG) first proposed the idea of REDD+ to the United Nations Framework Convention on Climate Change (UNFCCC) in 2005, REDD+ has become a leading approach to environmental governance. At COP21 in 2015, REDD+ was cemented in the *Paris Agreement* (UNFCCC, 2015) which explicitly recognises the importance of results-based payments for emissions reductions from deforestation and forest degradation. Alongside this prominence in the international climate regime, REDD+ has generated debates in academia (Milne and Adams, 2012; Mahanty et al., 2012; Dressler et al., 2012), with particular focus on the effectiveness and cost-efficiency of market-based mitigation measures (Miles, 2007; Laurance, 2008; Angelsen et al., 2012) and the equity dimensions for forest-dependent communities (Corbera et al., 2007; Long et al., 2010; Thompson et al., 2011). To effectively reduce emissions, communities need to be recognised as key actors in decision-making to ensure benefits are distributed to people who rely on and manage the forests (Mathur et al., 2014). This paper contributes to these ongoing debates around REDD+ by critically analysing the dominance of scalar discourses within the REDD+ assemblage in PNG and how these discourses may reproduce inequalities.

With significant forest resources, PNG has been a proponent of REDD+ internationally and is a pilot country for the UN-REDD Programme. REDD+ is just one expression of environmental governance in PNG's long history of engagement with conservation and development initiatives (van Helden, 1998; Filer and Sekhan, 1998; West, 2006), but it has become a dominant approach to addressing climate change and deforestation. In a country with the third-largest tract of intact tropical rainforest in the world (Babon and Gowae, 2013), forests are important, not only for the environment and economy, but for the people who live with them and depend on them. REDD+ has gained traction in PNG as over 95 percent of the country's greenhouse gas emissions are from land use, land use change and forestry (LULUCF) (Babon and Gowae, 2013: iix). While there have been conflicting accounts of the causes of deforestation in PNG, commercial logging and subsistence agriculture are identified as the main drivers (Shearman et al., 2009; Filer et al., 2009). PNG is unique among REDD+ countries as 97 percent of the land and almost all forests are owned by customary landowners (Filer et al., 2009). Furthermore, most of the population live in rural areas and rely on subsistence agriculture (Laurance et al., 2012). As such, forest-dependent communities play a cental role in implementing REDD+ projects which often involve changes in subsistence practices. It is within this context that the REDD+ assemblage has been coming together in PNG.

Over the past decade, an array of institutions, policies and projects

E-mail address: pascoe1@student.unimelb.edu.au.

have been developed in PNG to implement REDD + .[1] While the early years of REDD + were marred by challenges related to governance, transparency and corruption (Melick, 2010; Pearse, 2012; Pettit, 2012), the PNG government have undertaken a range of REDD + readiness activities, including the development of institutional frameworks, organisational capabilities and demonstration activities (Grussu et al., 2014; Filer, 2015). PNG is now in the second phase of REDD + and has already established a *National REDD + Strategy* (2017), safeguards and steps towards a national forest monitoring system and an investment plan to facilitate results based payments. A number of pilot projects have also been initiated, including the Central Suau REDD + Pilot Project in the Milne Bay Province, which is a key demonstration site for REDD + . Developed by the Secretariat of the Pacific Community and the German aid agency Deutsche Gesellschaft für Internationale Zusammenarbeit (SPC/GIZ), the Central Suau REDD + Pilot Project encompasses 64,000 ha of lowland forest owned by 110 clans with an estimated population of 7000 people (SPC/GIZ, 2015). The project was initially proposed as a Reduced Impact Logging (RIL) site, but after a feasibility study it was changed to a conservation project (SPC/GIZ, 2013). Subsistence agriculture is identified as a major cause of deforestation in this area so a conservation-based REDD + project necessitates forest-dependent communities alter their livelihood practices. This paper uses the Central Suau REDD + Pilot Project as a case study to examine and problematise the dominance of scalar discourses within the REDD + assemblage in PNG, particularly how these discourses enable and constrain certain actors to engage in decision-making.

Scalar discourses – that is, ways of understanding the world that pre-define categories of scale and organise hierarchies, such as the 'global,' 'national' and 'local' – have come to dominate how we frame and address climate change and, thus, how we design, implement and evaluate environmental governance initiatives. For example, Sovacool and Brown (2009) have analysed climate change mitigation and adaptation in terms of scales of action and argued that global, national and local scales of action must be combined in order to achieve emission reductions and avoid dangerous climate change impacts. In terms of REDD + , scale has come to dominate the ways in which such projects are implemented and evaluated with literature focused on which scale REDD + projects should operate at (Angelsen et al., 2008) and how benefits should be shared across scales (Angelsen et al., 2012; Luttrell et al., 2013). Recent research has explored the 'global' and 'local' dynamics, contestations and complexities of REDD + projects (McGregor et al., 2015; Eilenberg, 2015; Asinyabi, 2015). More specifically, studies on REDD + in PNG have criticized the government's 'national' approach to REDD + as heavily top-down and paternalistic (Chatterton, 2010; Pettit, 2012: 177), and called for greater attention to 'local' consultation and livelihood needs (Leggett and Lovell, 2012). However, this dominance of scalar discourses is problematic as it reifies categories and hierarchies which may mask underlying power relations and inequalities.

As such, this paper interrogates and challenges the dominance of scalar discourses by engaging with REDD + as an assemblage. An assemblage is not an entity or product in itself; it is an ongoing process of relations coming together and frictions emerging. I adopt assemblage-thinking as a theoretical orientation and method that focuses on relationality, heterogeneity and emergence. Assemblages, as specific ways of arranging social relations, offer a way to analyse spatiality and power not as products or things, but as relational effects (Allen, 2003: 66). Rather than treating assemblage and scale as mutually-exclusive or contradictory concepts, I investigate how these approaches intersect and the power relations at play as certain discourses of spatiality become dominant.

To begin this task, I ask what relations and frictions make up the

institutional REDD + assemblage in PNG. Relations and frictions are not just objects of investigation, but are also the means of inquiry to analyse REDD + as an assemblage (Holbraad and Pedersen, 2017: 171). Relations cannot exist prior or independently of their enactment and are made visible through practices like work and exchange (Strathern, 1988; Demian, 2000). In line with Tsing (2005), I use the concept of 'friction' to explore the awkward, unequal and unstable aspects of interconnection across difference. After tracing the relations and frictions, I question how scalar discourses hold together the REDD + assemblage in PNG and how they have become dominant in policy-making processes. I then investigate how these scalar discourses have translated into the Central Suau REDD + Pilot Project and point to the frictions and inequalities that may emerge as certain actors are excluded from decision-making. Finally, I consider how assemblage-thinking can be used to interrogate scalar discourses around climate change and environmental governance. But first, I review the theoretical literature that grounds assemblage-thinking and the politics of scale and detail the methodologies and approach used in this study, namely institutional ethnography and discourse analysis.

2. Theoretical and conceptual framings

2.1. Assemblage-thinking

Drawing on Actor-Network Theory, assemblage-thinking considers the ways that humans and non-humans are entangled in socio-natural configurations (Burnham et al., 2016). Following Li (2007), I define an assemblage as "an ongoing labour of bringing disparate elements together and forging connections between them." Rather than pre-emptively defining the way the social world is made, assemblage-thinking focuses on telling a story that captures the multiple connections and relationships between sites and actors (Mol, 2010). Assemblages are relational, heterogeneous, partial, unstable and situated; they do not follow pre-determined scales, hierarchies or configurations of relations (Ong, 2005; Collier and Ong, 2005; Grossberg, 2014; Muller, 2015).

Assemblage-thinking is indebted to Deleuze and Guattari and their emphasis on relationality, multiplicity, emergence and resistance to totalizing categories (Deleuze, 1994; Deleuze and Guattari, 1987; Cockayne et al., 2017: 581). Deleuze and Guattari prompt us to map assemblages of complex processes, including multiple, interconnecting dimensions of the biological, climatological, economic, political, social and cultural (Bonta and Protevi, 2004: 15). Horowitz (2016) has drawn on Deleuze and Guattari's concept of assemblage to examine encounters between large-scale conservation and indigenous activism in New Caledonia. West (2016) has also linked Deleuze and Guattari's notion of 'becoming' to recent moves towards multispecies ethnography in her research into conservation assemblages in PNG. Similarly, this paper engages with assemblage-thinking to interrogate relations of power and inequalities within the REDD + assemblage in PNG. Within assemblage-thinking, power is a relational effect of social interaction, not a property of someone or something; it is only through the mediation of relations that power operates (Allen, 2003).

Importantly, assemblage-thinking rejects hierarchical discourses of scale where 'local interactions' are embedded in a wider and larger 'global context' (Latour, 2005: 176). As assemblage-thinking enables us to remain open to relations and avoid fixed and bounded categories (Anderson and McFarlane, 2011; Tsing, 2015), it is particularly useful for examining climate change and environmental governance, which are often closely intertwined with scalar discourses. Assemblage-thinking has been used to understand the multiple epistemologies through which climate change is known and experienced (Burnham et al., 2016). For example, Burnham et al. (2016) have adopted assemblage theory to explore how smallholder knowledge of climate change is structured through interactions with dynamic socio-natural assemblages.

Some effort has been made to analyse REDD + as an assemblage

---

[1] Babon's (2014) thesis provides a comprehensive account of the political ecology of REDD + in PNG.

that gathers divergent interests at different scales and is held together by its 'global' reach (Arora-Jonsson et al., 2016). Anderson (2016) has examined REDD + as an assemblage that brings together heterogeneous policies, projects, concepts and actors at a particular spatio-temporal conjuncture. Li (2014) has looked at how expert knowledge holds together governance assemblages, like REDD +, and attempts to fix certain actors in place. Building on this work, I analyse REDD + as an assemblage to foreground the complex relations that emerge under environmental governance interventions and avoid reifying scalar discourses that pre-define the spatiality of these relations.

2.2. The politics of scale

Engaging with literature on the politics of scale (Smith, 1990; Towers, 2000; Brenner, 2001; Benson, 2010), this paper is grounded in the position that scale is not an ontological category, but an epistemology that makes assumptions about how we can know and organise the world (Jones, 1998; Kurtz, 2003: 893). Scale is not a thing 'out there' to discover; it only becomes meaningful when it is operationalised as a way of knowing and organising reality (Ahlborg and Nightingale, 2012). In this way, scale is no longer viewed as a predetermined, unproblematic and fixed hierarchy of bounded spaces which order the world as 'global,' 'national' and 'local' (Delaney and Leitner, 1997: 93; Marston, 2000: 220). The drawing of boundaries between scales and bounding of spatial categories as 'fixed entities' acts as a means of inclusion, exclusion and legitimation (Kurtz, 2003: 887).

Within the literature on human geography, scholars have critiqued the dominant hierarchical visions of scale and developed alternatives (Mansfield, 2005; Ostrom, 2010). Notably, Marston et al. (2005) have called for human geography to replace scale with 'flat ontology' – an alternative to hierarchical scale which is composed of complex, emergent spatial relations. The concept of flat ontology has developed out of engagement with Deleuzian visions of difference and critiques of scalar thought (Cockayne et al., 2017: 581). While I agree with Marston et al. (2005) that the categorical and hierarchical assumptions reinforced by scalar discourses are problematic, I do not suggest that we abandon scale entirely. Instead, I draw attention to the power relations and inequalities at play as scalar discourses become dominant and exclude certain groups from decision-making.

Despite these critical debates around scale, climate change and environmental governance continue to be framed in scalar terms and focus is often placed on global governance and national action (Smith, 2007: 200; Tschakert, 2012: 147). To try and counter this emphasis, literature on climate justice has questioned the dominance of the global and national scales in debates on climate change and highlighted the significance of local experiences (Fisher, 2012; Mathur et al., 2014). Nevertheless, much of this literature actually works to reify scale as a bounded category that organises reality in a particular way. Without critical analysis of the fluid and strategic ways that scale operates in relation to climate change and environmental governance, the static categories of 'global,' 'national' and 'local' become fixed (Martello and Jasanoff, 2004: 14). In contrast, this paper does not presuppose the existence of such scales and examines the power relations behind scalar discourses.

3. Methodologies and approach

Drawing on this approach to assemblage-thinking and the politics of scale, this study combines the methods of institutional ethnography and discourse analysis. Li (2014) has demonstrated how ethnographic techniques are well suited to tracing the effects of environmental governance assemblages. Institutional ethnography provides insights into policy-making that may be overlooked by discourse analysis alone (Smith, 2005; Devault, 2006). However, discourse analysis offers a valuable tool to expose potentially hegemonic discourses in environmental governance regimes (Fairclough, 1992; Hajer and Versteeg,

2005). In line with Dryzek (2005: 9), I understand 'discourses' as shared ways of apprehending the world which construct meanings and relationships while defining legitimate knowledge based on certain assumptions. Discourse analysis is indebted to Foucault (1972; 1980) and his work on the intersections of discourse, power and knowledge (Harvey, 1996: 86). While discourses can emerge from a range of arenas, including the scientific community and public sphere[2] (Weingart et al., 2000), I concentrate on the policy sphere as a site where discourses can become institutionalised and hegemonic.

I undertook institutional ethnography – namely elite interviews and participant observation – to learn about the relations and frictions that compose the REDD + assemblage in PNG. During nine-months of fieldwork in PNG, I conducted institutional ethnography in the capital Port Moresby and in Alotau, Milne Bay Province for a period totalling eight weeks. The Climate Change Department and Forestry Department[3] were the focal points for this study as they are the main policy-making and implementing agencies for REDD + in PNG. Additionally, I conducted elite interviews and meetings with the Conservation Department, Land Department, international governing bodies, donor agencies, technical advisory bodies, non-government organisations (NGOs) and local level governments (LLGs). Starting with a pre-selected group of contacts, interviews were semi-structured and devised to get a sense of the relationships within the REDD + assemblage and identify additional actors to be included in the research. While questions were not explicitly focused on scale, the interviews were designed to recognise scalar discourses that may be institutionalised in these agencies. Plain language statements and consent forms were used to ensure that participants could give free, prior, informed consent to take part in the research. Where consent was given for interviews to be audio-recorded, I used discourse analysis to code the transcriptions and analyse the use of scalar discourses by first identifying scalar language – that is, certain vocabulary defining entities, categories or hierarchies of scale and the semantic relations between such vocabulary, for example, references to the 'global,' 'national' and 'local.'

The method of discourse analysis adopted in this study focused on the use of scalar language, the actors who are adopting and reinforcing scalar discourses and the policy outcomes and social impacts (Adger et al., 2001). In addition to interview transcripts, this method was used to code key documents[4] that hold together the REDD + assemblage in PNG, including decisions from the UNFCCC on REDD +, the PNG government's policies and strategies as well as project design documents from the Central Suau REDD + Pilot Project. Firstly, I identified scalar language and analysed such terms in context to highlight patterns or inconsistencies in the way that scalar language was employed. Additionally, I considered the actors producing scalar discourses in these policy documents and their situatedness and interests in the REDD + assemblage to get a better understanding of the power relations and inequalities at play. While these documents have been taken from institutions that have been constituted and operate at different scales, I do not intend to reify scalar discourses by presuming the existence of such scales or drawing hierarchical relations between them. Instead, I analyse REDD + as an assemblage and then investigate how scalar discourses work to stabilise this assemblage and, in the process, define arenas of governance that may marginalise certain actors.

---

[2] See Babon et al (2012) for a discourse analysis of print media articles on REDD + in PNG.

[3] To protect the anonymity of participants, the names of institutions, including government departments, have been de-identified throughout this paper.

[4] A full list of the documents coded in this analysis is included as an Appendix A.

4. The REDD+ assemblage in PNG – relations and frictions

This section begins to analyse REDD+ in PNG as an assemblage by tracing the relations and frictions that emerge as REDD+ draws together a complex network of institutional actors. The REDD+ assemblage in PNG is always emerging and shifting over time and space, so this analysis is focused on the specific conjuncture during which institutional ethnography was undertaken. The relations and frictions emerging during this period are contextualised in terms of the history of REDD+ in PNG and more recent policy developments. This focus on institutional actors is only part of the story; a much more heterogeneous mix of human and non-human actors are entangled in REDD+ as it intersects with forests and customary land tenure systems. Nevertheless, an analysis of the institutional REDD+ assemblage provides a starting point to consider the relations and frictions that can emerge within environmental governance regimes.

Through institutional ethnography and interviews with actors in Port Moresby and Alotau, it became clear that REDD+ assembles in various ways in PNG. There are formal networks, like the Technical Working Groups (TWGs) run by the Climate Change Department, and informal relations, like the personal connections forged between officers and communities during fieldwork for the Central Suau REDD+ Pilot Project. Cross-departmental TWGs were established in 2010 and are chaired by the Climate Change Department. Fujisaki et al. (2016) have conducted research into these TWGs to understand the interactions among actors, including national agencies, international governing bodies, NGOs, donors and industry. However, local communities and customary landowners were notable exclusions from the 21 recorded stakeholders (Fujisaki et al., 2016: 8–9). Commenting on the relations among actors in the TWGs, a staff member of an international governing body supporting REDD+ in PNG stated that, "Inter-agency coordination is very, very weak." They went on to explain:

"In the beginning, this chain between all these stakeholders and departments was broken. So now we are playing, we are building that bridge between all these stakeholders coming together, working together, discussing together, all this REDD+. And almost all assignments, even we struggle, we face – I mean – challenges, but we are building that bridge between all these stakeholders to work together."

This improvement in stakeholder relations is important to contextualise in regards to the development of the *National REDD+ Strategy* (2017) in PNG. The launch of this strategy was seen by some as strengthening certain relations in the assemblage. A representative of a conservation NGO saw that the development of this strategy had enhanced the relations between the Climate Change Department and international governing bodies.

But other policies have not had such positive impacts on relations. The *Climate Change (Management) Act* (2015) generated significant frictions between the Climate Change Department and the Forestry Department, which are the main policy-making and implementing departments for REDD+ in PNG, respectively. Relations between these departments have been strained over time; early confusion over the division of roles and responsibilities has been an ongoing source of tension (Filer, 2012; Babon, 2014: 137; Dalsgaard and Pedersen, 2015). While these relations are fluid and constantly being remade, the *Climate Change (Management) Act* (2015) has exacerbated frictions around the distribution of authority. A staff member from the Forestry Department discussed this:

"At that time the relationship was very good, until the climate change bill came in. ... The relationship is, I don't know at the moment, but now I am not fully attending the Technical Working Group. But that Climate Change Act has infringed into other sector activities and that is where there are some concerns raised. ... For example, the REDD+ is now under [the Climate Change

Department], so we have nothing to do with REDD+. So, for example, previously we were running the project base, like Central Suau. Now the Act says that if we are doing any kind of climate change activities we have to go through the [Climate Change Department]. So, that's why we couldn't move any further with the Central Suau project. ... So, although we did all, most of the groundwork on Central Suau, when the Act, bill passed then that was the end."

From the perspective of at least one staff member in the Climate Change Department:

"We still have discrepancies with sectors in terms of they feel like our Act has overridden, superseded – well it has superseded their acts. So, that has caused friction I would say. But I'd say the Act was there and they were given ample time to come back to us, however there was no feedback. ... We are in the process of reviewing the Act also. ... We don't want to create disharmony, especially with policies because policies ... have a great effect on what the outcome will be for the country."

Other actors, including NGOs, mentioned the *Climate Change (Management) Act* (2015) not only as a source of friction, but also as a trigger to strengthen certain alliances within the assemblage. For example, the Forestry Department drew on the support of NGOs in their criticism of the legislation. This illustrates how changes in the institutional and policy landscape impact on the REDD+ assemblage in varied ways and how the assemblage is always shifting as a result.

Reporting to the UNFCCC also generates some friction. Staff of the Forestry Department complained that they do not submit reports to the UNFCCC, but send the information to the Climate Change Department because the latter is the designated national authority. Those in the Climate Change Department do not go as far as calling this a 'tension,' but one clarified:

"We have some challenges in data collection. ... I won't say tension that's going on, but it's just that each sector has its own roles and responsibilities and they want to safeguard themselves ... Yes, like some of the data we cannot use unless they [the Forestry Department] give us permission. ... That boils down to, okay then, if we are doing this and is it for individual benefit or is it for the country? Or do we hate someone there and that's why we are doing that? And you know, it's just bringing all sorts of confusion I'd say."

Other frictions emerge from relations with the Conservation Department. Following TWG meetings in 2017, the Conservation Department were still trying to identify their role in the REDD+ assemblage. One staff member expressed that the Conservation Department are "not really involved in REDD+." However, staff were attending workshops on REDD+ to "try and understand REDD+" and how the Conservation Department might be able to "do REDD+." Again, there was some friction around duplication of roles. Representatives of the Conservation Department expressed that REDD + should complement their work on conservation and protected areas and include such initiatives under their programs. But one person perceived that the Climate Change Department resists conservation approaches to REDD+ as "there is nothing to measure."

By examining some of the relations that comprise the institutional REDD+ assemblage in PNG, we can appreciate how REDD+ draws together diverse actors over space and time and investigate the frictions that emerge, particularly through changes in policy and legislation and access to resources and authority. In addition to highlighting how the REDD+ assemblage in PNG is always emerging and shifting, I have also pointed to the ways that scalar discourses hold the assemblage together, which I now turn to problematising.

4.1. Scalar discourses in the REDD+ assemblage in PNG

By tracing the relations and frictions that make up the REDD+ assemblage in PNG, we can already see scalar discourses emerging. Actors strategically employ scalar discourses in an attempt to stabilise REDD+ by defining categories and hierarchies where certain actors and actions can exist. Throughout the institutional ethnography, scalar language – namely 'global,' 'regional,' 'national,' 'provincial,' 'district' and 'local' – was frequently employed. Language of 'going down' and 'filtering down' was also regularly adopted in relation to REDD+. Such statements were combined with body language where actors frequently used hand gestures to depict scale as a vertical ladder, one even going as far to draw a diagram of the provincial, district and ward levels organised hierarchically.

Staff working for an international governing body discussed the 'top-down' approach to REDD+ in PNG and one commented: "Here [it is] very crucial to build the standing of the national stakeholders. It's like [a] top-down approach. And then bringing them, or scaling them down to the local level." One member of the Climate Change Department explained how this works, "When the direction is held at the national level, we can in turn filter it down through different levels of government." Another officer justified this:

"At the local scale, I think the way that I see it is the major hindrance would be the guys at the provincial level knowing what the guys at the national level want. What the direction is. ... So that's why now most of the actions and approaches we are doing are policy-based. We have to know where we are going so we can give guidance to the guys at the provincial level, who will in turn provide the necessary guidance further down."

These sentiments were repeated frequently during institutional ethnography, indicating a strong discourse around hierarchies of scale. Within this discourse, the importance of a national approach to REDD+ was often stressed during discussions around the voluntary carbon market (VCM). Carbon markets are often characterised into two groups: compliance markets and VCMs. Compliance markets are created from international and national regulations that impose limits on emissions and allow actors to trade and sell credits. In comparison, VCMs are driven by demand from corporations and private consumers wanting to improve their corporate social responsibility and reduce their carbon footprints (Dalsgaard, 2016: 71). As Dalsgaard (2016) notes, both types of markets rely on different conceptual scales – the compliance market, in particular, necessitates national action which is regulated at the global scale. Under the compliance mechanism established by the UNFCCC, the PNG government has adopted a national approach to REDD+ and, consequently, opposes any VCM activities that might undermine this. One staff member at an international governing body operating in PNG declared:

"The challenge here in the country is ... they mix the REDD+ of the UNFCCC approach with VCM, which is absolutely wrong. ... The market is limited, first of all, and the benefits go to specific community. This is not ... a national approach and this is absolutely out of UNFCCC compliance approach. And when we talk about the country level, the national level, think, we always think about the benefits going to the country under UNFCCC. ... This is not project-based approach, this is national-based approach. The benefits go to the country, rather than to a specific group of the people."

In line with the adoption of the compliance approach, actors in the REDD+ assemblage in PNG consistently privileged the national scale as an arena for policy-making and action and the global scale as the arena for governance. Throughout the interviews, frequent references were made to the 'national REDD+ strategy,' 'national approach,' 'national safeguards,' 'national forest base map,' 'national forest inventory,' and 'national land use plan.' Stakeholders also referred to 'cascading

relationships' between the UNFCCC negotiations and national implementation. Staff at the Climate Change Department mentioned that they look to the global scale for 'guidance' and follow the modalities laid out by the UNFCCC.

Yet some actors in the REDD+ assemblage in PNG, particularly the Forestry Department, did acknowledge the problems of this scalar discourse which privileges the global and national scales. Following the launch of the *National REDD+ Strategy* (2017), staff at the Forestry Department commented that the strategy was, as the name suggests, more about the national scale, not local communities. Staff at the Forestry Department argued that other scales also need to be considered:

"Because we have the national and then we have the provincial and the local and then we have the district and then it goes as far as the ward level, so we should consider all levels. ... We most times talk about the national, but then we have to also consider the local scale, their perspective. At the end, it is them who will implement at their level, so we should also consider their perspective at the local scale as well."

This institutional ethnography has revealed how scalar discourses work to hold the REDD+ assemblage together by defining hierarchical levels and delimiting arenas of governance and action. While actors adopt scalar language in an attempt to stabilise the REDD+ assemblage, such discourses can become hegemonic when they are institutionalised in policy-making processes.

4.2. The dominance of scalar discourses

Actors constantly reproduce hierarchies within the REDD+ assemblage in PNG through the use of scalar language. These scalar discourses can also become embedded in policy-making processes, particularly in the documents, legislation and strategies that work to make the REDD+ assemblage cohere (Arora-Jonsson et al., 2016). As such, we can investigate how scalar discourses may become dominant through discourse analysis of such documents. This section analyses the scalar discourses within policy documents from the international climate regime and PNG government to investigate how such discourses define arenas of decision-making.

Across the UNFCCC decisions on REDD+, scalar language was consistently used to establish 'global,' 'regional,' 'national,' 'subnational' and 'local' scales. This hierarchy of scales is evident from the first submission proposing REDD+ to the UNFCCC at COP11 (PNG and Costa Rica, 2005). Scalar discourses become more explicit in subsequent documents, including the *Paris Agreement* (2015) from COP21 which recognises "the importance of the engagements of all levels of government and various actors" and emphasises the need for "global, regional, national and subnational cooperation" (UNFCCC, 2015). Similarly, the PNG government's policies and strategies on climate change and REDD+ draw boundaries between these scales and extend such hierarchies to the 'provincial,' 'district,' 'ward,' 'clan' and 'village' levels.

In addition to establishing a hierarchy of scales, the scalar discourses identified in this analysis define arenas of decision-making and action. To a large extent, the 'global' scale is constructed as the predominant arena for environmental governance. In the UNFCCC documents, climate change is framed at the global scale and mitigation measures, like REDD+, are designed to be governed at this level. Frequent references were made to: 'global climate change,' 'global emissions,' 'global efforts,' 'global negotiations,' 'global mitigation,' 'global responsibilities,' 'global action,' 'global effort,' 'global response,' 'global priorities,' 'global goal,' 'global agreement,' 'global forest cover,' 'global mechanism' and the 'global REDD+ scheme.' These scalar discourses are reinforced through climate science (Miller, 2004); the *Fifth Assessment Report* (IPCC, 2013) analysed in this study highlights how the Intergovernmental Panel on Climate Change (IPCC) privileges the

global scale by using global climate models and associated scalar language.[5]

Scalar discourses also delineate the national scale as the central arena in which REDD+ policy-making and implementation should take place. Throughout the documents analysed here, emphasis was placed on 'national circumstances,' 'national interests,' 'national priorities,' 'national development,' 'national capabilities,' 'national needs,' 'national action,' 'national planning' and 'national mitigation.' This is apparent from the first proposal of REDD+ to the UNFCCC, which necessitates the adoption of national baseline rates of deforestation (PNG and Costa Rica, 2005), and continues through the *Cancun Agreement* (UNFCCC, 2010), which requires that developing countries establish a national strategy or action plan for REDD+ as well as national forest emissions reference levels and national forest monitoring systems. The *Warsaw Framework for REDD+* (UNFCCC, 2013) also stipulates that countries implementing REDD+ need to designate a national entity or focal point under the UNFCCC and the *Paris Agreement* (UNFCCC, 2015) uses nationally determined contributions (NDCs) to calculate emissions reductions.

Accordingly, the PNG government's policies frequently refer to: 'national REDD+ strategy,' 'national REDD+ framework,' 'national REDD+ management,' 'national REDD+ readiness activities,' 'national reference levels and targets,' 'national greenhouse gas inventory' and 'national safeguards.' The *National Climate Compatible Development Management Policy* (GoPNG, 2014: 16) states that, "The National Government has the legitimate position to address climate change at the local level and regional level by adapting and improving planning, policy priorities and capital funding …" REDD+ activities at other scales are expected to be undertaken in 'strict alignment' with national policies and programs.

The construction of a 'subnational' scale within these documents extends the national scale's arena of influence. For example, the *Bali Roadmap* (UNFCCC, 2007) explicitly states that, "Subnational approaches, where applied, should constitute a step towards the development of national approaches, reference levels and estimates." The *National REDD+ Strategy* (GoPNG, 2017: 26) also uses this language, while PNG's *Readiness Preparation Proposal* (R-PP) affirms:

> "…REDD+ implementation should be conducted in a coordinated manner within this [sic] government systems such that the links between implementation of REDD+ activities at the sub-national level influence and or captured clearly in the national level policies."
>
> (FCPF, 2013: 11)

> "Adequate systems and procedures will need to be in place to reconcile the monitoring and performance of sub-national activities within national level monitoring, both to understand the contribution of sub-national activities to overall national performance, but also with regards to issues such as leakage."
>
> (FCPF, 2013: 76)

The construction of a sub-national scale works to extend the influence of the national scale, but this also curtails the agency of the local scale. The local scale has been largely overlooked and overshadowed in terms of decision-making; references to the local scale are limited, when they do appear in these documents, they are typically in relation to 'local communities,' 'local landowners,' 'local people,' 'local resource-users,' 'local customs,' 'local capacity-building' and 'local benefit-sharing arrangements.' The only mention of 'local action' across the documents analysed appeared in the *Climate-compatible Development for Papua New Guinea* (GoPNG, 2010) report and, even then, this reinforced

a hierarchy of scales: "Climate change requires action at multiple levels: international agreements, national plans and local actions must complement each other." To a large extent, the local scale is constructed as a place for REDD+ awareness and benefit-sharing, not as an arena for decision-making.

This analysis of policy documents from the international climate regime and PNG government reveals how scalar discourses have become dominant within the REDD+ assemblage in PNG. Scalar discourses work to stabilise the REDD+ assemblage in PNG by defining categories and hierarchies which delimit arenas of governance, decision-making and action. These scalar discourses have also translated into the Central Suau REDD+ Pilot Project in the Milne Bay Province, which may generate inequalities for certain actors as these discourses are put into practice.

4.3. How scalar discourses translate in the Central Suau REDD+ Pilot Project

By analysing how scalar discourses translate in the Central Suau REDD+ Pilot Project, we can see how scalar hierarchies have both discursive and practical consequences. The dominance of scalar discourses within the institutions and policies holding the REDD+ assemblage together has also translated to the project design documents of the Central Suau REDD+ Pilot Project. These documents continue to adopt scalar language, including references to 'global,' 'national,' 'local,' 'provincial,' 'district' and 'ward' levels. In this way, scalar discourses come into practice as projects are designed to recognise the agency of some people, at some scales, and exclude others.

In line with the construction of the global scale as the predominant arena for REDD+ governance, the Central Suau project design documents focus on achieving global emissions reductions and validation through international standards, specifically the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity (CCB) standard (SPC/GIZ, 2013: 9). Likewise, the proposed benefit-distribution system for the project pushes for a "national legal framework and governing body" to ensure that "vertical benefits devolve only as far as the ward level, within which they will be shared by all community/ward members" (SPC/GIZ, 2015: 4–5). The ward scale is constructed as the level where benefits should be distributed, which again bounds people at this scale and frames customary landowners as recipients, rather than decision-makers or active participants in REDD+. The emphasis on global environmental governance and national decision-making within the Central Suau REDD+ Pilot Project ignores the agency of local people and the role they play in governing their environments.

As scalar discourses have been translated in the Central Suau REDD+ Pilot Project, people in Suau have tried to make sense of them. While few people in Suau have seen or read the project design documents, some people have been exposed to these scalar discourses through the visiting teams of foresters, scientists and consultants developing these reports and the REDD+ awareness programs run by the Forestry Department. By recognising the frictions that emerge as scalar discourses are translated in Suau, we can start to problematise the dominance of scalar hierarchies in the REDD+ assemblage in PNG.

People in Suau negotiate the scalar discourses underpinning REDD+, but there are notable frictions around the exclusion of local knowledge, forest management and decision-making. One villager recognised climate change and REDD+ as a global issue, but emphasised the importance of local knowledge: "Because it's a global issue, we try our best to understand the basics of it, not so much of how it will impact in the global sense, but in local knowledge, what does REDD+ mean to us." Another landowner acknowledged that climate change was a global phenomenon, but emphasised that REDD+ is about local forest use:

> "That would be the translation I would say, trying to explain to a simple villager, that the concept itself is basically telling us that we

---

[5] Scalar language within the IPCC (2013) *Summary for Policymakers* included 'global-scale observations,' 'global-scale changes,' 'global patterns,' 'global carbon cycle,' 'global water cycle,' 'global-mean surface temperature' and 'global-mean sea-level rise.'

need to be wise in using our forest because of this global phenomenon that has so much carbon dioxide released into the atmosphere by foreign countries. And we, as a virgin country who has got the forest intact, we need to maintain our forest to help reduce those emissions that are released by the major industrial countries."

In this way, scalar discourses are imbued with power and influence who can use resources, at what scale and how. These scalar discourses have translated in the Central Suau REDD+ Pilot Project, but people continue to dispute and resist such discourses that ignore their agency. While scalar discourses have largely excluded local people from decision-making, people in Suau want to play an active role in REDD+. A leader from Suau argued:

"I'd just like to see the agencies involved, even the government and our foreign partners who are pushing for REDD+, to really come out with the clear plan and the local content of how we are going to participate and benefit in the REDD+ program. And so that's how I really want to see REDD+ move and some of the things, areas that we are struggling in, and for them to come and capture what areas we need to get support for. Rather than making decision up there, come down and consult with us and see what's best for us and we can be able to dialogue and share some of those ideas."

By examining how scalar discourses translate into the Central Suau REDD+ Pilot Project, we can see the practical consequences, and potential inequalities, of the dominance of scalar discourses. Scalar hierarchies, which construct the global and national scales as arenas of REDD+ governance and policy-making, also exclude certain groups from engaging in decision-making.

5. Interrogating scale through assemblage-thinking

Institutional ethnography and discourse analysis have demonstrated the dominance of scalar discourses within the REDD+ assemblage in PNG and how they have become embedded in policy-making processes across government departments and projects, including the Central Suau REDD+ Pilot Project. To a large extent, scalar discourses have become hegemonic; even when actors try to critique the hierarchies which privilege the 'global' and 'national' above the 'local,' they continue to reinforce such categories and relations of domination. This is problematic as scalar discourses may reproduce inequalities by defining arenas of governance and decision-making which exclude certain actors.

As we have seen in an analysis of the REDD+ assemblage in PNG, scalar discourses draw boundaries around arenas of governance, policy-making and action which enable and constrain different actors in engaging in decision-making. Across REDD+ policies and government departments, the global and national scales are privileged as arenas of governance. Such scalar discourses can reinscribe inequalities, especially when 'local' people are refused involvement in REDD+ decision-making. In the case of the Central Suau REDD+ Pilot Project, local people have largely been excluded from decision-making in favour of actors positioned at the national and global scales, actors who reinforce these scalar discourses. When scalar discourses become dominant in environmental governance regimes like REDD+, the voices of certain social groups are silenced and erased; 'local' people in particular are collectivized and fixed in place (West, 2006: 32; Li, 2014). The bounding of communities at the 'local' scale also denies the complex relationships that people are entwined in which do not conform to scalar hierarchies. As assemblage-thinking does not pre-define relations, it can provide an alternative frame to avoid reproducing the inequalities generated by scalar discourses.

This paper does not propose that assemblage should replace scale; they are not mutually exclusive or contradictory concepts, rather they are intersecting and interconnected ways of making sense of the world. Instead, it suggests that we interrogate and challenge the dominance of scalar discourses by using assemblage-thinking to avoid reinscribing hierarchies and resultant inequalities by remaining open to relations and attentive to heterogeneity and emergence. The purpose of this analysis is not to denounce scale as a false image of reality, but to bring attention to the power relations through which certain discourses become dominant (Ferguson and Gupta, 2002). Deleuzian ideas of assemblage, in particular, allow us to examine arrangements of power emerging from the interplay between space and time – this diverts our attention away from the scale at which power relations operate at, towards the relational arrangements of which they are part (Allen, 2003: 90).

By tracing the relations and frictions that make up the REDD+ assemblage in PNG, I have pointed to the power relations that shape who has agency to act and in what spaces. Different actors in the REDD+ assemblage in PNG have different interests and degrees of influence to reproduce scalar discourses, which in turn enable or constrain different groups to engage in decision-making. Indeed, government departments and international governing bodies have significantly more decision-making power than forest-dependent communities in Central Suau. This is evident in the TWGs which draw together actors in the REDD+ assemblage in PNG, but notably exclude communities and customary landowners (Fujisaki et al., 2016). It is crucial to recognise the uneven resources of power, money, information and time that different social actors use to instil scalar discourses, which may reproduce inequalities (Herod and Wright, 2002: 11). The systematic exclusion of certain groups from decision-making processes restricts people's capacity to engage in and benefit from REDD+ (Nathan and Pasgaard, 2017). By treating power as a relational effect, assemblage-thinking offers a theoretical orientation and method to examine the complex relations that come together around REDD+, without reinscribing certain hierarchies and inequalities.

6. Conclusion

When entering the office building that houses the Climate Change Department in Port Moresby, a large banner greets you at the door which reads:

"REDD+ Papua New Guinea
Healthy forest.
Strong nation.
Better world."

This banner symbolises the dominance of scalar discourses in the REDD+ assemblage in PNG. This banner's emphasis on creating a 'better world' and 'strong nation,' points to the way global environmental governance and national policy-making have been privileged in the REDD+ assemblage. As with this banner, local people are also largely ignored and excluded from decision-making around REDD+. Scalar discourses not only work to hold the REDD+ assemblage in PNG together, by stabilising categories and hierarchies, but they define arenas of governance and decision-making that exclude certain actors.

In this paper, I have used institutional ethnography and discourse analysis to interrogate the dominance of scalar discourses within the REDD+ assemblage in PNG. Institutional actors within the REDD+ assemblage reproduce hierarchies by adopting scalar language and privileging global governance and national policy-making. These scalar discourses have become dominant within policy-making processes, particularly decisions on REDD+ from the UNFCCC and the PNG government's policies and strategies on climate change and REDD+. Moreover, scalar discourses have translated into the Central Suau REDD+ Pilot Project. As such, the construction of scale has discursive and practical consequences for people implicated in REDD+ projects. While people in Suau attempt to negotiate these scalar discourses, they are continually marginalised through scalar framings that bound certain people to certain places and ignore their agency. The dominance of scalar discourses thus reinscribes inequalities, which may further

marginalise forest-dependent communities. This is particularly problematic for REDD + projects, like the Central Suau REDD + Pilot Project, where the effectiveness of emissions reductions rests on the participation of people practicing subsistence agriculture.

Assemblage-thinking is useful for interrogating scalar discourses as it foregrounds the interplay between complex realities and simplified models (Bonta and Protevi, 2004: 16). In the context of environmental change and governance, it is becoming increasingly important to hold onto the complexity, multiplicity and contextuality of contestations and realisations of power (Grossberg and Behrenshausen, 2016: 1026). In order to challenge the dominance of scalar discourses around climate change and environmental governance, I have used assemblage-thinking to emphasise the relationality, heterogeneity and emergence of REDD +. As we have seen, the REDD + assemblage in PNG is constantly moving; the assemblage continually shifts as relations are made and remade, as frictions are generated through changes in institutions and policies. Assemblage-thinking offers a more complex picture of REDD + which captures multiple relations and frictions between actors and sites. Through assemblage-thinking, we can focus on the relationality, heterogeneity and emergence of REDD + processes, while remaining aware of the ways that hierarchies are constantly reproduced within environmental governance regimes.

Holding assemblage-thinking and scalar discourses in a productive tension offers a way to examine how environmental governance assemblages, like REDD +, attempt to cohere and stabilise. Investigating REDD + in this way highlights the value of adopting assemblage-thinking to critically engage with the politics of scale. Through foregrounding relationality and emergence over predefined categories of scale, a different, and more nuanced, picture of REDD + develops. By analysing power relations and inequalities within scalar discourses, we can problematise and complicate often presupposed and simplistic scalar discourses.

Acknowledgements

Appendix A. List of Documents Coded in the Discourse Analysis

Forest Carbon Partnership Facility. 2013 *Readiness Preparation Proposal (R-PP)*. PNG: FCPF and UN-REDD.

Government of Papua New Guinea. 2010. *Climate-compatible Development Strategy – Second Draft for Stakeholder Comment*. Port Moresby: GoPNG.

Government of Papua New Guinea. 2014. *National Climate Compatible Development Management Policy*. Port Moresby: GoPNG.

Government of Papua New Guinea. 2015. *Climate Change (Management) Act*. Port Moresby: GoPNG.

Government of Papua New Guinea. 2017. *Papua New Guinea National REDD + Strategy for the period of 2017–2027*. Port Moresby: GoPNG.

IPCC. 2013. 'Summary for Policymakers'. In *Climate Change 2013: The Physical Science Basis*. Switzerland: IPCC.

Papua New Guinea and Costa Rica. 2005. *Reducing emissions from deforestation in developing countries: approaches to stimulate action*.

Papua New Guinea. 2016. *Intended Nationally Determined Contribution (INDC) Under the United Nations Framework Convention on Climate Change*.

SPC/GIZ. 2013. *REDD + Feasibility Study for Central Suau, Milne Bay, Papua New Guinea*. Edited by S. A. Stanley. Suva: SPC/GIZ

SPC/GIZ. 2014a. *Forest Carbon Inventory in Proposed Central Suau REDD + Area, Milne Bay Province, Papua New Guinea*. Suva, Fiji: SPC/GIZ.

SPC/GIZ. 2014b. *Analysis of Historical Deforestation, Degradation and Land Use in Central Suau/Papua New Guinea*. Suva: SPC/GIZ.

SPC/GIZ. 2015a. *Measurement, Reporting and Verification (MRV) Manual for Improved Forest management (Logged to Protected Forest) in Central Suau REDD + area/Papua New Guinea*. Suva: SPC/GIZ.

SPC/GIZ. 2015b. *Proposed Benefit Sharing System for REDD + pilot project in Central Suau/Papua New Guinea*. Edited by N. Sullivan. Suva: SPC/GIZ.

UNFCCC. 2005. *Report of the Conference of the Parties on its eleventh session, held at Montreal from 28 November to 10 December 2005*.

UNFCCC. 2007. *Bali Action Plan contained in the 'Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007*.

UNFCCC. 2010. *Cancun Safeguards 'The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*.

UNFCCC. 2013. *Warsaw Framework for REDD + – Decisions 9–15 in the 'Report of the Conference of the Parties on its nineteenth session, held in Warsaw from 11 to 23 November 2013*.

UNFCCC. 2015. *Paris Agreement taken from the 'Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015*.

UN-REDD. 2010. *UN Collaborative Programme on Reducing Emissions from Deforestation And Forest Degradation In Developing Countries – Joint Programme Document (NJP)*. PNG: UNDP, FAO, UNEP and OCCD.

References

Adger, W. Neil, Benjaminsen, Tor A., Brown, Katrina, Svarstad, Hanne, 2001. Advancing a political ecology of global environmental discourses. Dev. Change 32 (4), 681–715.

Ahlborg, Helene, Nightingale, Andrea J., 2012. Mismatch between scales of knowledge in nepalese forestry: epistemology, power, and policy implications. Ecol. Soc.

Allen, John, 2003. Lost Geographies of Power. Blackwell Publishing, Oxford.

Anderson, Zachary R., 2016. Assembling the 'Field': conducting Research in Indonesia's Emerging Green Economy. Curr. Res. Southeast Asia 9 (1), 173–180.

Anderson, Ben, McFarlane, Colin, 2011. Assemblage and geography. Area 43 (2), 124–127.

Angelsen, A., Streck, C., Peskett, L., Brown, J., Luttrell, C., 2008. What is the Right Scale for REDD? The Implications of National, Subnational and Nested Approaches. CIFOR, Bogor, Indonesia.

Angelsen, A., Brockhaus, M., Sunderlin, W.D., Verchot, L.V. (Eds.), 2012. Analysing REDD +: Challenges and choices. CIFOR, Bogor, Indonesia.

Arora-Jonsson, Seema, Westholm, Lisa, Petitt, Andrea, Temu, Beatus Jon, 2016. Carbon and cash in climate assemblages: the making of a New Global Citizenship. Antipode 48 (1), 74–96.

Asinyabi, Adeniyi, 2015. Mind the gap: global truths, local complexities in emergent green initiatives. In: Bryant, R.L. (Ed.), The International Handbook of Political Ecology. Edward Elgar, Cheltenham.

Babon, Andrea, 2014. Our Carbon, Their Forest: The Political Ecology of Reducing Emissions from Deforestation and Forest Degradation (REDD +) in Papua New Guinea. Research Institute for the Environment and Livelihoods, Charles Darwin University.

Babon, Andrea, Gowae, Gae, 2013. The Context of REDD + in Papua New Guinea: Drivers agents and institutions. CIFOR, Bogor, Indonesia.

Babon, Andrea, McIntyre, Daniel, Sofe, Ronald, 2012. REDD + Politics in the Media: A Case Study from Papua New Guinea. CIFOR, Bogor, Indonesia.

Benson, Melinda Harm, 2010. Scaling the climate response and responding to conceptions of scale. Ann. Assoc. Am. Geogr. 100 (4), 1025–1035.

Bonta, Mark, Protevi, John, 2004. Deleuze and Geophilosophy: A Guide and Glossary. Edinburgh University Press, Edinburgh.

Brenner, N., 2001. The limits to scale? Methodological reflections on scalar structuration. Prog. Hum. Geogr. 25 (4), 591–614.

Burnham, Morey, Ma, Zhao, Zhang, Baoqing, 2016. Making sense of climate change: hybrid epistemologies, socio-natural assemblages and smallholder knowledge. Area 48 (1), 18–26.

Chatterton, Paul. 2010. Review of the UN-REDD Joint Program in Papua New Guinea.

Cockayne, Daniel G., Ruez, Derek, Secor, Anna, 2017. Between ontology and re-presentation: locating Gilles Deleuze's 'difference-in-itself' in and for geographical thought. Prog. Hum. Geogr. 41 (5), 580–599.

Collier, Stephen J., Ong, Aihwa, 2005. Global Assemblages, Anthropological Problems. In: Ong, A., Collier, S.J. (Eds.), Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems. Blackwell Publishing, Oxford.

Corbera, Esteve, Brown, Katrina, Neil Adger, W., 2007. The equity and legitimacy of markets for ecosystem services. Development & Change 38 (4), 587–613.

Dalsgaard, Steffen, 2016. Carbon valuation: alternatives, alternations and lateral measures? Val. Stud. 4 (1), 67–91.

Dalsgaard, Steffen, Pedersen, Marianne, 2015. The portable sawmill and other challenges to REDD+ in Papua New Guinea. Asia Pacific Viewpoint 56 (1), 128–139.

Delaney, David, Leitner, Helga, 1997. The political construction of scale. Polit. Geogr. 16, 93–97.

Deleuze, G., 1994. Difference and Repetition. Columbia University Press, New York.

Deleuze, G., Guattari, F., 1987. A Thousand Plateaus: Capitalism and Schizophrenia. University of Minnesota Press, Minneapolis.

Demian, Melissa, 2000. Longing for completion: toward an aesthetics of work in Suau. Oceania 71 (2), 94–109.

Devault, Marjorie L., 2006. Introduction: what is institutional ethnography? Soc. Probl. 53 (3), 294–298.

Dressler, Wolfram, McDermott, Melanie, Smith, Will, Pulhin, Juan, 2012. REDD policy impacts on indigenous property rights regimes on Palawan Island, the Philippines. Hum. Ecol. 40 (5), 679–691.

Dryzek, John S., 2005. The Politics of the Earth: Environmental Discourses, secon ed. Oxford University Press, New York.

Eilenberg, Michael, 2015. Shades of green and REDD: Local and global contestations over the value of forest versus plantation development on the Indonesian forest frontier. Asia Pacific Viewpoint 56 (1), 48–61.

Fairclough, Norman, 1992. Discourse and Social Change. Polity Press, Cambridge.

Ferguson, James, Gupta, Akhil, 2002. Spatializing states: toward an ethnography of neoliberal governmentality. Am. Ethnol. 29 (4), 981–1002.

Filer, C., 2012. Why green grabs don't work in Papua New GUinea. J. Peasant Stud. 39 (2), 599–617.

Filer, Colin, 2015. How April Salumei became the REDD Queen. In: Bell, J.A., West, P., Filer, C. (Eds.), Tropical Forests of Oceania: Anthropological Perspectives. ANU Press, Canberra.

Filer, Colin, Keenan, Rodney, Allen, Bryant, McAlpine, John, 2009. Deforestation and forest degradation in Papua New Guinea. Ann. For. Sci. 66, 813.

Filer, C., Sekhran, N., 1998. Loggers, Donors and Resource Owners. Policy that Works for Forests and People Series No. 2: Papua New Guinea. National Research Institute (NRI) and International Institute for Environment and Development (IIED), Port Moresby and London.

Fisher, Susannah, 2012. The emerging geographies of climate justice. Geogr. J. 181 (1), 73–82.

Forest Carbon Partnership Facility, 2013. Papua New Guinea Readiness Preparation Proposal (R-PP). FCPF and UN-REDD.

Foucault, M., 1972. The Archeology of Knowledge. Translated by A. S. Smith. Harper Colophon, New York.

Foucault, M., 1980. Power/knowledge: Selected interviews and other writings, 1972–77. Translated by R. Hurley. Pantheon, New York.

Fujisaki, Taiji, Hyakumura, Kimihiko, Scheyvens, Henry, Cadman, Tim, 2016. Does REDD+ Ensure Sectoral Coordination and Stakeholder Participation? A Comparative Analysis of REDD+ National Governance Structures in Countries of Asia-Pacific Region. Forests 7 (195), 1–17.

Government of Papua New Guinea (GoPNG), 2010. Climate-compatible development for Papua New Guinea: Second Draft for Stakeholder Comment. GoPNG, Port Moresby.

Government of Papua New Guinea (GoPNG), 2014. National Climate Compatible Development Management Policy. OCCD, Port Moresby.

Government of Papua New Guinea (GoPNG), 2017. Papua New Guinea National REDD+ Strategy for the Period of 2017–2027. GoPNG, Port Moresby.

Grossberg, Lawrence, 2014. Cultural Studies and Deleuze-Guattari, Part 1: a polemic on projects and possibilities. Cult. Stud. 28 (1), 1–28.

Grossberg, Lawrence, Behrenshausen, Bryan G., 2016. Cultural studies and Deleuze-Guattari, Part 2: from affect to conjunctures. Cult. Stud. 30 (6), 1001–1028.

Grussu, G., Attorre, F., Mollicone, D., Dargusch, P., Guillet, A., Marchetti, M., 2014. Implementing REDD+ in Papua New Guinea: can biodiversity indicators be effectively integrated in PNG's National Forest Inventory? Plant Biosyst. 148 (3), 519–528.

Hajer, Maarten, Versteeg, Wytske, 2005. A decade of discourse analysis of environmental politics: achievements, challenges, perspectives. J. Environ. Plann. Policy Manage. 7 (3), 175–184.

Harvey, David, 1996. Justice, Nature, and the Geography of Difference. Blackwell Publishers, Cambridge, Mass.

Herod, Andrew, Wright, Melissa W., 2002. Placing scale: an introduction. Geogr. Power 1.

Holbraad, Martin, Pedersen, Morten Axel, 2017. The Ontological Turn: An Anthropological Exposition. Cambridge University Press, Cambridge.

Horowitz, Leah S., 2016. Rhizomic Resistance Meets Arborescent Assemblage: UNESCO World Heritage and the Disempowerment of Indigenous Activism in New Caledonia. Annals Am. Assoc. Geogr. 106 (1), 167–185.

IPCC, 2013. Summary for policymakers. Climate Change 2013: The Physical Science Basis. IPCC, Switzerland.

Jones, Katherine T., 1998. Scale as epistemology. Polit. Geogr. 17 (1), 25–28.

Kurtz, Hilda E., 2003. Scale frames and counter-scale frames: constructing the problem of environmental injustice. Polit. Geogr. 22, 887–916.

Latour, Bruno, 2005. Reassembling the Social: An Introduction to Actor-Network-Theory. Oxford University Press, Oxford.

Laurance, W.F., 2008. Can carbon trading save vanishing forests. Bioscience 58 (4), 286–287.

Laurance, William F., Kakul, Titus, Tom, Memory, Wahya, Reza, Laurance, Susan G., 2012. Defeating the 'resource curse': Key priorities for conserving Papua New Guinea's native forests. Biol. Conserv. 1, 35.

Leggett, Matthew, Lovell, Heather, 2012. Community perceptions of REDD+: a case study from Papua New Guinea. Clim. Policy (Earthscan) 12 (1), 115–134.

Li, Tania Murray, 2007. Practices of assemblage and community forest management. Econ. Soc. 36 (2), 263–293.

Li, Tania Murray, 2014. What is land? Assembling a resource for global investment. Trans. Brit. Inst. Geogr. 39, 589–602.

Long, Stephanie, Roberts, Ellen, Dehm, Julia, 2010. Climate justice inside and outside the UNFCCC: the example of REDD. J. Austr. Polit. Econ. 66, 222–246.

Luttrell, Cecilia, Loft, Lasse, Gebara, Maria Fernanda, Kweka, Demetrius, Brockhaus, Maria, Angelsen, Arild, Sunderlin, William D., 2013. Who should benefit from REDD+? Rationales and realities. Ecol. Soc. 18 (4), 1–18.

Mahanty, Sango, Milne, Sarah, Dressler, Wolfram, Filer, Colin, 2012. The social life of forest carbon: property and politics in the production of a new commodity. Hum. Ecol. 40 (5), 661–664.

Mansfield, Becky, 2005. Beyond rescaling: reintegrating the 'national' as a dimension of scalar relations. Prog. Hum. Geogr. 29 (4), 458–473.

Marston, S.A., 2000. The social construction of scale. Prog. Hum. Geogr. 24 (2), 219–242.

Marston, Sallie A., Jones, John Paul, Woodward, Keith, 2005. Human geography without scale. Trans. Brit. Inst. Geogr. 4, 416–432.

Martello, Marybeth Long, Jasanoff, Sheila, 2004. Introduction – globalization and environmental governance. In: Jasanoff, S., Martello, M.L. (Eds.), Earthly Politics: Local and Global in Environmental Governance. MIT Press, London.

Mathur, Vivek N., Afionis, Stavros, Paavola, Jouni, Dougill, Andrew J., Stringer, Lindsay C., 2014. Experiences of host communities with carbon market projects: towards multi-level climate justice. Clim. Policy 14 (1), 42–62.

McGregor, Andrew, Eilenberg, Michael, Coutinho, Joana Borges, 2015. From global policy to local politics: the social dynamics of REDD+ in Asia Pacific. Asia Pacific Viewpoint 56 (1), 1–5.

Melick, David, 2010. Credibility of REDD and experiences from Papua New Guinea. Conserv. Biol. 2, 359.

Miles, Lera, 2007. Reducing Emissions from Deforestation: Global Mechanisms, Conservation and Livelihoods.

Miller, Clark A., 2004. Climate science and the making of a global political order. In: Jasanoff, S. (Ed.), States of Knowledge: The Co-production of Science and Social Order. Routledge, London.

Milne, Sarah, Adams, Bill, 2012. Market Masquerades: uncovering the politics of community-level payments for environmental services in Cambodia. Development & Change 43 (1), 133–158.

Mol, Annemarie, 2010. Actor-network theory: sensitive terms and enduring tensions. Kölner Zeitschrift für Soziologie und Sozialpsychologie 50 (1), 252–269.

Muller, Martin, 2015. Assemblages and actor-networks: rethinking socio-material power, politics and space. Geogr. Compass 9 (1), 27–41.

Nathan, Iben, Pasgaard, Maya, 2017. Is REDD+ effective, efficient, and equitable? Learning from a REDD+ project in Northern Cambodia. Geoforum 83, 26–38.

Ong, Aihwa, 2005. Ecologies of expertise: assembling flows, managing citizenship. In: Ong, A., Collier, S.J. (Eds.), Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems. Blackwell Publishers, Ocford.

Ostrom, Elinor, 2010. Polycentric systems for coping with collective action and global environmental change. Glob. Environ. Change 20, 550–557.

Papua New Guinea and Costa Rica, 2005. Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action. COP11,UNFCCC, Montreal.

Pearse, Rebecca, 2012. Mapping REDD in the Asia-Pacific: Governance, marketisation and contention. Ephemera: Theory Polit. Organ. 12 (1/2), 181–205.

Pettit, Marguerite, 2012. Reducing emissions from deforestation and degradation: human rights and the commodification of carbon. Asia Pacific J. Environ. Law 14 (1/2), 87–103.

Shearman, Phil L., Ash, Julian, Mackey, Brendan, Bryan, Jane E., Lokes, Barbara, 2009. Forest conversion and degradation in Papua New Guinea 1972–2002. Biotropica 41 (3), 379–390.

Smith, N., 1990. Afterword: the beginning of geography. In: Smith, N. (Ed.), Uneven Development. Blackwell, Cambridge, MA.

Smith, Dorothy E., 2005. Institutional ethnography: a sociology for people. Alta-Mira Press, Lanham.

Smith, Heather, 2007. Disrupting the global discourse of climate change: the case of indigenous voices. In: Pettenger, M.E. (Ed.), The Social Construction of Climate Change: Power Knowledge, Norms, Discourses. Ashgate, Burlington.

Sovacool, Benjamin K., Brown, Marilyn A., 2009. Scaling the policy response to climate change. Policy Soc. 27, 317–328.

SPC/GIZ, 2013. REDD Feasibility Study for Central Suau, Milne Bay, Papua New Guinea. SPC/GIZ, Suva, Fiji.

SPC/GIZ, 2015. Proposed Benefit Sharing System for REDD+ Pilot Project in Central Suau/Papua New Guinea. SPC/GIZ Regional Project, Suva, Fiji.

Strathern, M., 1988. The Gender of the Gift: Problems with Women and Problems with Society in Melanesia. University of California Press, Berkeley.

Thompson, Mary C., Baruah, Manali, Carr, Edward R., 2011. Seeing REDD+ as a project

of environmental governance. Environ. Sci. Policy 14, 100–110.

Towers, George, 2000. Applying the political geography of scale: grassroots strategies and environmental justice. Prof. Geogr. 52 (1), 23.

Tschakert, Petra, 2012. From impacts to embodied experiences: tracing political ecology in climate change research. Geografisk Tidsskrift-Danish J. Geogr. 112 (2), 144.

Tsing, Anna Lowenhaupt, 2005. Friction: An Ethnography of Global Connection. Princeton University Press, Princeton.

Tsing, Anna Lowenhaupt, 2015. The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins. Princeton University Press, Princeton.

UNFCCC, 2013. Report of the Conference of the Parties on its Nineteenth Session, held in Warsaw from 11 to 23 November 2013.

UNFCCC, 2007. Report of the Conference of the Parties on its Thirteenth Session, held in Bali from 3 to 15 December 2007.

UNFCCC, 2010. The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention.

UNFCCC, 2015. Report of the Conference of the Parties on its Twenty-First Session, held in Paris from 30 November to 13 December 2015.

van Helden, Flip, 1998. Between Cash and Conviction: The Social Context of the Bismarck-Ramu Integrated Conservation and Development Project. The National Research Institute, Boroko.

Weingart, Peter, Engels, Anita, Pansegrau, Petra, 2000. Risks of communication: discourses on climate change, politics, and the mass media. Publ. Understand. Sci. 9 (3), 261–283.

West, Paige, 2006. Conservation is our government now: the politics of ecology in Papua New Guinea, New ecologies for the twenty-first century. Duke University Press, Durham.

West, Paige, 2016. Dispossession and the Environment: Rhetoric and Inequality in Papua New Guinea. Columbia University Press, New York.